



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Randall M. Franklin et al. Application No.: 10/615,075 Filed: July 8, 2003 Title: Analytical Method and Device for Determining Metal Concentration in Liquid Hydrocarbon Matrices Attorney Docket No.: NM 7593	Art Unit: 1743 Examiner: Keri Moss
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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Declaration by Dr. Joseph W. Roos

Dear Sir:

I, Joseph W. Roos declare and say:

1. I am a co-inventor of the present patent application. I have been continuously employed by the assignee of the present application, Afton Chemical, and its predecessor in interest, since 1989. My current title is Technical Director Fuels R&D. I have a doctorate in Chemical Engineering from Louisiana State University. I have studied the Office Action of September 7, 2006 in the above-identified case. Similarly, I have restudied the present application. I submit this Declaration in support of patentability of the present application.

2. In the Office Action, the Examiner states that the application's specification did not describe the subject matter in such a way as to reasonably convey to one skilled in the relevant art that the invention was in our possession at the time the application was filed. Contrary to this assertion of the Examiner, I believe that one of ordinary skill

in the relevant art would appreciate, at the time the application was filed, that colorimetric detection kits were commercially available and that such kits contained both detection materials and sensitizer chemicals. The application recites that colorimetric detection kits were available at the time the application was filed. The application also provides an example of a commercially available kit that is operable with the present invention. In addition, the application describes at least one example of how an organometallic complex is formed. Given the explanation of the underlying chemistry and procedure, it would be apparent to one of ordinary skill in the art, upon reading the application, what an organometallic complex is in accordance with the subject application.

3. The example colorimetric detection strip and colorimetric sensitizer chemical disclosed in the specification were supplied as a kit under the name of "REFLECTOQUANT Manganese Test." The use of the kit, which includes Reagent No. 1 and Reagent No. 2, is disclosed in the specification of the subject application. The colorimetric detection material either acts to, or contains a substance that acts to (i.e., the sensitizer chemical), "colorimetrically detect or facilitate detection of the presence of an organometallic complex or the metal thereof." The kit disclosed in the specification, however, was optimized for detecting manganese in aqueous media and did not work for liquid hydrocarbon matrices.

4. In the Office Action, the Examiner states that the breadth of the claims is broad. The method and system of the present invention includes means to cause a reaction between the metal from the organometallic compound and the colorimetric sensitizer chemical or to otherwise liberate the metal in the organometallic compound

from the compound. The independent claims also state that the detection occurs in a hydrocarbon matrix. Therefore, the breadth of the claims is defined and clear to anyone of skill in the art.

5. In the Office Action, the Examiner states that the term 'colorimetric sensitizer chemical' is not a recognized term of art. However, as the Examiner identifies in at least one old patent reference, it was known to colorimetrically indicate the presence of metal ions. One of ordinary skill in the art would grasp the meaning of the term in question. The application also defines a colorimetric detection material, and the ability of the material to contain a substance (i.e., a colorimetric sensitizer chemical) that is able to colorimetrically detect or facilitate detection of the presence of an organometallic complex or the metal thereof.

6. In the Office Action, the Examiner states that no guidance is provided as to what types of chemicals are to be used. As stated above, a suitable detection kit is disclosed for use with the method and system of the subject invention. The kit that is disclosed includes the colorimetric sensitizer chemical and reagents. The particular steps of performing the claimed method are fully disclosed in the application.

Therefore, contrary to the Examiner's statement that no working example is provided, the application provides a working example of the colorimetric sensitizer chemical.

7. The Office Action further states that a broad range of experimentation would be required to touch upon all the areas covered by the claims. However, given the statements above, it would not take undue experimentation to practice the invention as claimed by the application or as taught by the specification. A kit that includes a

suitable detection material and sensitizer chemical is disclosed. The system and steps of the method are fully explained.

8. The Examiner states, without factual support, that chemical reactions are unpredictable by their very nature. However, chemical reactions can be, and routinely are, reproduced. The method and system provided by the application results in a reproducible method of detecting the presence of a metallic species in a hydrocarbon matrix. Once a reaction is understood it can be readily repeated.

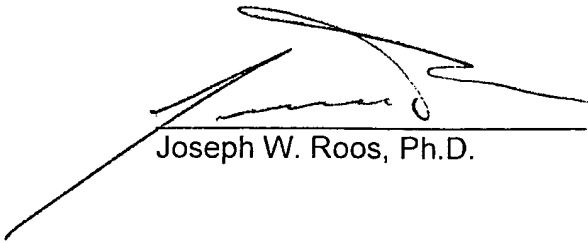
9. It is my understanding that a rejection under 35 USC 103 is based upon the obviousness of the invention. The Examiner combines two references to establish the obviousness of claims 17 and 18 (Zelaskowski and the Dynasol reference). Zelaskowski, at a minimum and per the Examiner's comments, does not teach an organometallic compound of manganese or methyl cyclopentadienyl tricarbonyl. Moreover, Zelaskowski, which teaches detecting lead in gasoline via the steps of mixing an iodine solution with the gasoline, subjecting the mixture to ultra-violet light, and adding an indicator solution containing 3-(2-pyridylazo)-resorcinol disodium salt with agitation, does not teach or suggest the present invention to one of ordinary skill in the art. More specifically, Zelaskowski states that "tetraorganoammonium halide is essential for the conversion of all organolead compounds in the gasoline *to water soluble iodides*." The test sample is mixed "with an aqueous solution of an acidic material which will not interfere with the colorimetric response in the subsequent step...This mixing produces a two phase mixture of gasoline and water." Eventually, "the aqueous phase is separated from the gasoline phase." This is inconsistent with the Examiner's contention that Zelaskowski discloses a method for detecting the presence

of a metallic species *in a hydrocarbon matrix*. One objective was to be able to conduct the test without transfer to an aqueous phase. For at least these reasons, it is my belief that Zelaskowski does not teach or suggest the subject invention alone or in combination with any cited reference.

10. Dynasol is said to teach a method of determining the presence of metals by binding an indicator dye to organometallic compounds such as organomagnesium or methyl cyclopentadienyl manganese tricarbonyl. There is no apparent suggestion to one of ordinary skill in the art to combine Dynasol with Zelaskowski. Even in combination, it is my belief that the references do not teach the invention as taught by the application. I further believe that the subject invention improves upon Dynasol and Zelaskowski.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 11/30/06



Joseph W. Roos, Ph.D.